Zonet®

ZEW2542

802.11n **Wireless** USB Adapter

USER MANUAL

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Chapter 1 Introduction

1.1 Welcome

Thank you for purchasing Zonet ZEW2542-802.11n wireless USB adapter. ZEW2542 connects you with IEEE802.11n(Draft 2.0) networks at receiving rate up to an incredible 300Mbps! By using the reflection signal, 802.11n's "Multiple In, Multiple Out" (MIMO) technology increases the range and reduces "dead spots" in the wireless coverage area. Unlike ordinary wireless networking of 802.11b/g standards that are confused by wireless reflections, MIMO can actually use these reflections to increase four times transmission range of 802.11g products. Besides, when both ends of the wireless link are 802.11n products, MIMO technology can utilize twice radio band to increase three times transmission speed of ordinary 802.11g standard products, and can comply with backwards 802.11b/802.11g standards.

Soft AP supported by ZEW2542 can help you establish wireless LAN networking with lowest cost. Besides, WPS (PBC and PIN) encryption method can free you from remembering the long passwords. Complete WMM function makes your voice and video more smooth.

1.2 Product Feature

- Complies with IEEE 802.11n (Draft 2.0), IEEE 802.11g, IEEE 802.11b standards
- Provides USB 2.0 interface
- Provides 300Mbps receiving rate and 150Mbps sending rate
- Supports 20MHz/40MHz frequency width
- Supports Soft AP to establish your wireless LAN networking with lowest cost
- Supports 64/128-bit WEP, WPA, WPA2 encryption methods and 802.1x security authentication standard
- Supports WPS (PBC and PIN) encryption method to free you from remembering long passwords
- Supports WMM to make your voice and video more smooth
- Supports Windows 2000 / XP / 2003 / Vista

1.3 Contents of Package

- One ZEW2542
- One USB Cable
- One Installation CD w/User Manual
- One Quick Installation Guide

Contact your local authorized reseller or the store purchased from for any items damaged and/or missing.

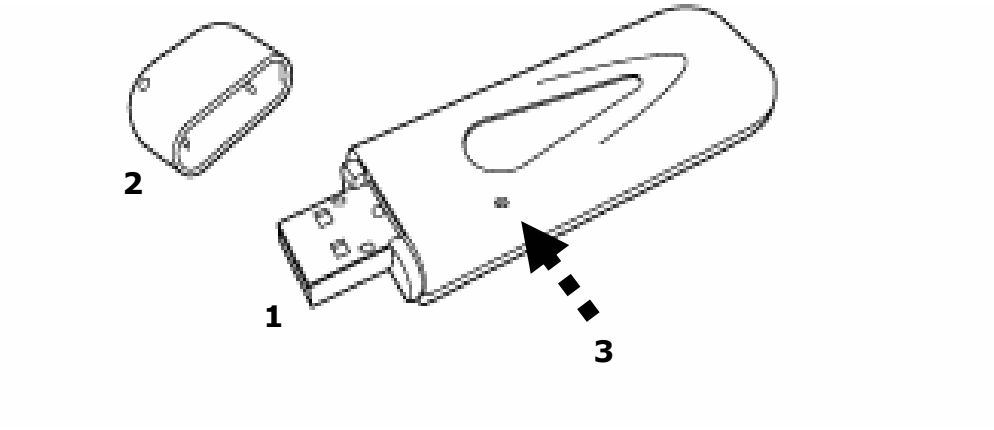
1.4 Before You Begin

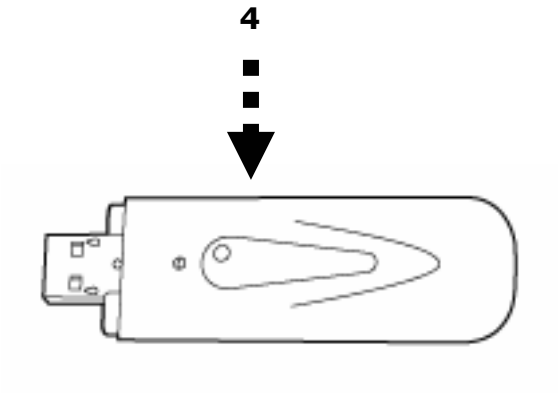
You must have the following:

- A laptop computer/desktop PC with an available USB 2.0/1.1 slot
- Minimum 300MHz processor and 32MB memory
- At least 100MB of available disk space
- Windows 2000, 2003, XP, 2003, Vista
- A CD-ROM Drive
- USB controller properly installed and working in the laptop computer
- 802.11n or 802.11b/g Access Point (for infrastructure Mode) or another 802.11n or 802.11b/g wireless adapter (for Ad-Hoc; Peer-to-Peer networking mode.)

Chapter 2 Designing Your ZEW2542

ZEW2542 supports up to 300Mbps connections. It is fully compliant with the specifications defined in 802.11n (Draft 2.0) standard.





1. USB Connector
2. Connector Cap (To protect USB connector when not in use)
3. Link/Activity LED
4. WPS Button (Press to activate WPS pairing mode)

The status LED indicators of ZEW2542 is described in the following.

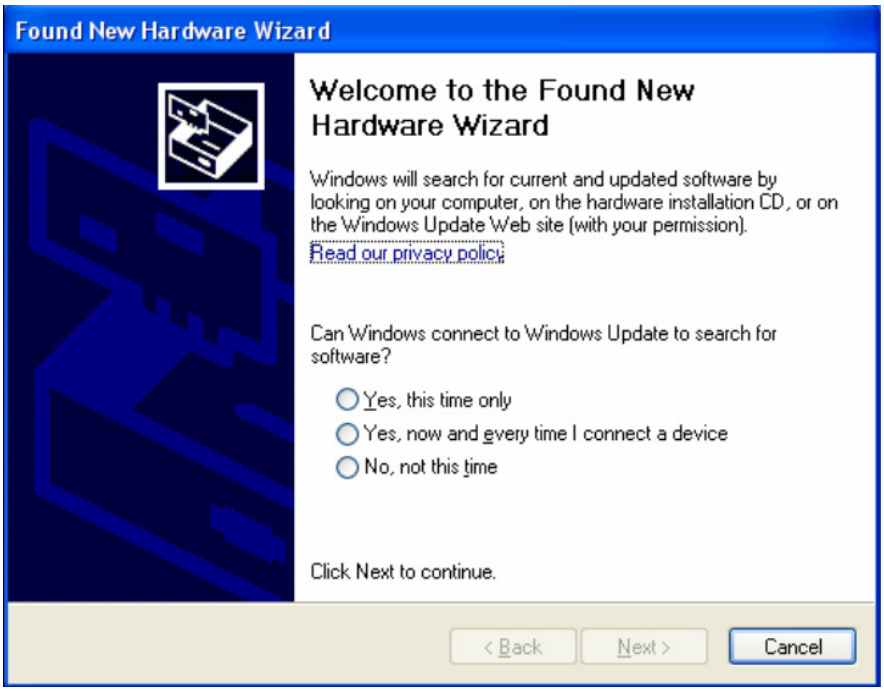
- Lnk/Act ON : Indicates a valid connection / transmitting or receiving data
- Lnk/Act OFF: Indicates there's no wireless activity.

Chapter 3 Installation

3.1 Install Your ZEW2542

- Power on your PC, let the operating system boot up completely, and log in as needed.
- Hold ZEW2542 and insert it into a USB slot.

- Select ***Cancel*** when "Found New Hardware" window appears.

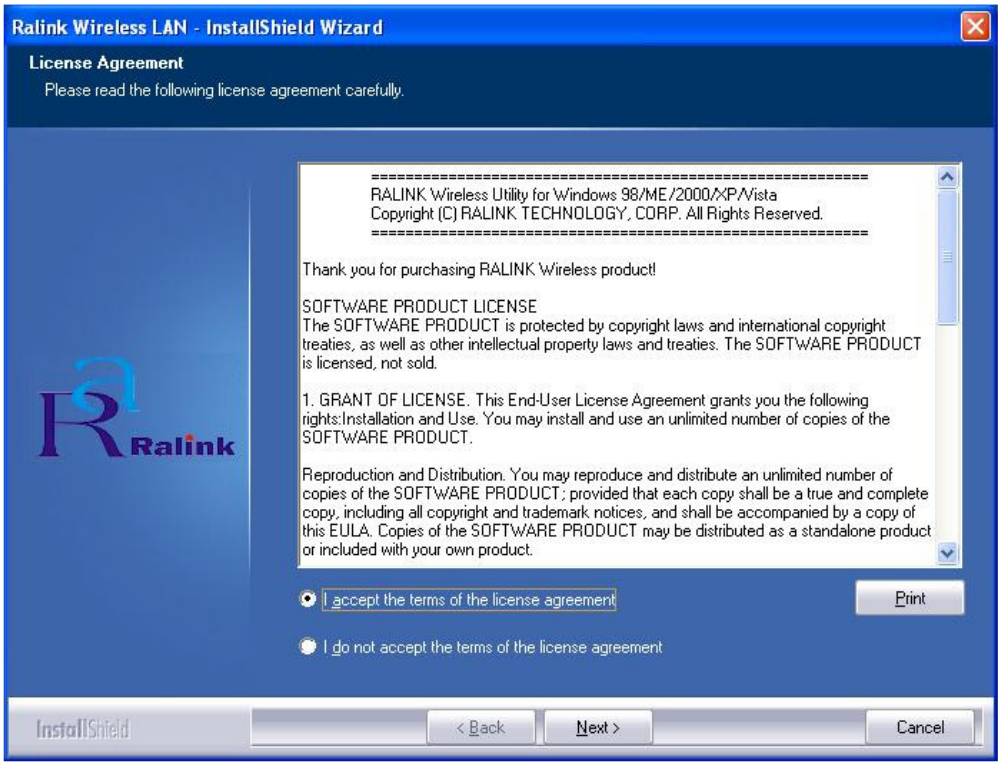

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

3.2 Install Driver and Utility

NOTE: *Snap-shot screens of the following installation procedure are based on Windows XP. Installation procedures will be similar for other windows operating systems.*

1. Insert Installation CD to your CD-ROM drive. Browse CD and double-click **setup.exe** in Driver folder to execute it. The wizard will run and install all necessary files to your computer automatically.

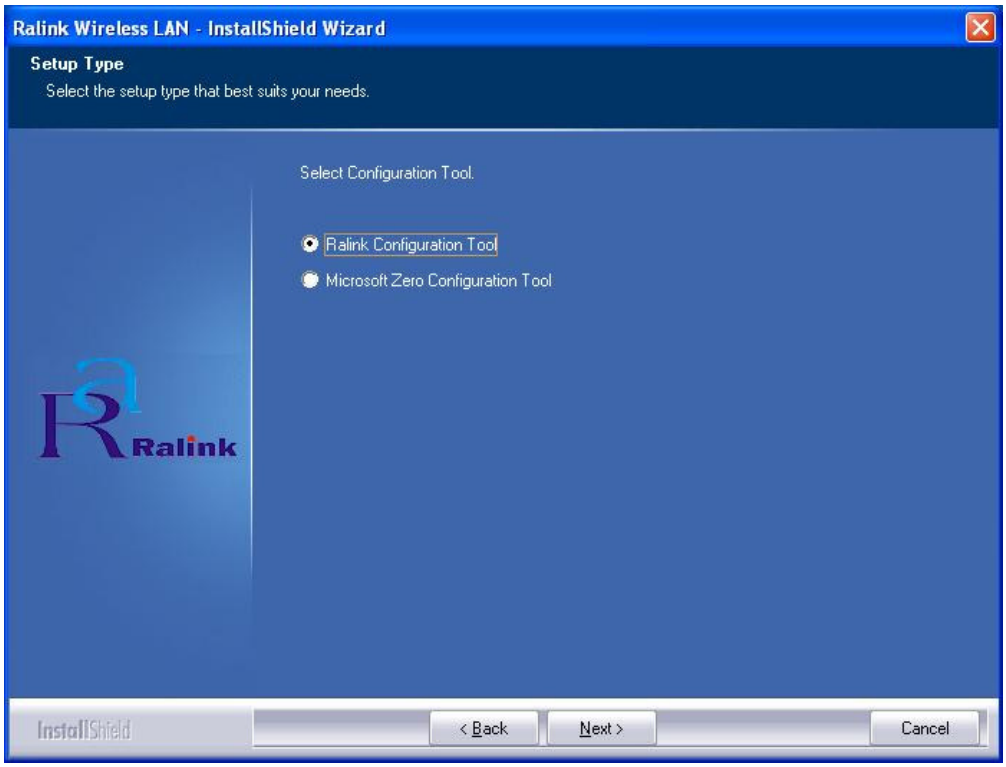
2. Click ***Next*** to accept the Agreement. Or click ***Cancel*** to cancel the installation.


Ralink Wireless LAN - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
RALINK Wireless Utility for Windows 98/ME/2000/XP/Vista
Copyright (C) RALINK TECHNOLOGY, CORP. All Rights Reserved.
Thank you for purchasing RALINK Wireless product!
SOFTWARE PRODUCT LICENSE
The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE PRODUCT is licensed, not sold.
1. GRANT OF LICENSE. This End-User License Agreement grants you the following rights:Installation and Use. You may install and use an unlimited number of copies of the SOFTWARE PRODUCT.
Reproduction and Distribution. You may reproduce and distribute an unlimited number of copies of the SOFTWARE PRODUCT; provided that each copy shall be a true and complete copy, including all copyright and trademark notices, and shall be accompanied by a copy of this EULA. Copies of the SOFTWARE PRODUCT may be distributed as a standalone product or included with your own product.
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
Ralink
InstallShield
< Back
Next >
Cancel

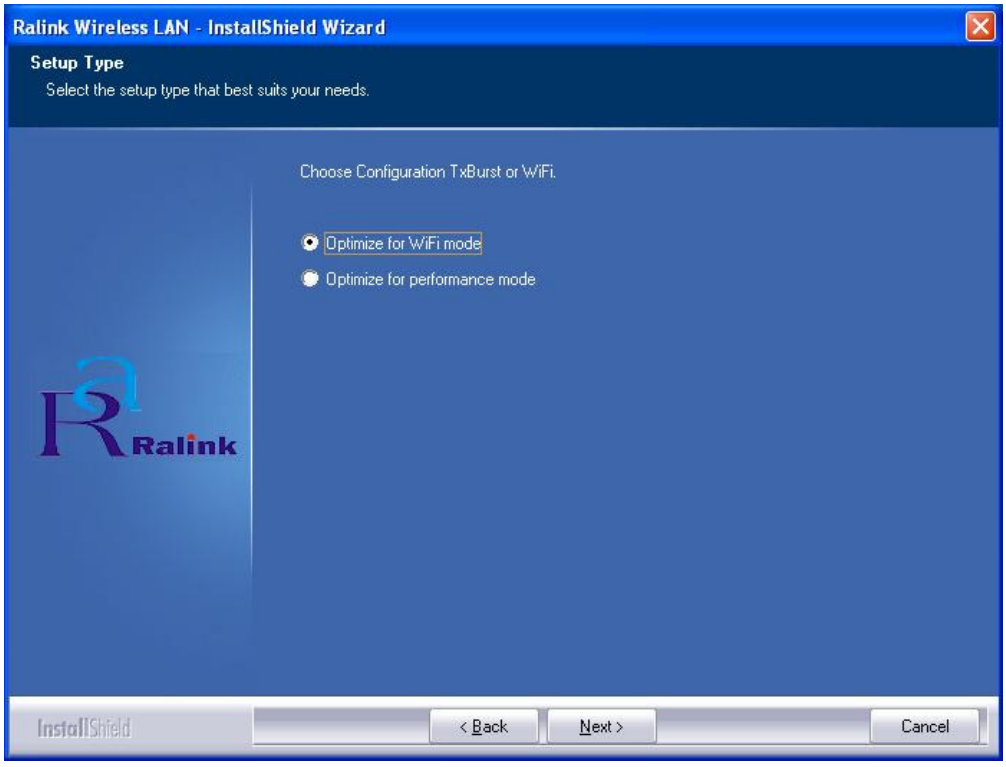
3. Select ***Ralink Configuration Tool*** or ***Microsoft Zero Configuration Tool*** then click ***Next***.

    a. It's recommended to select **Ralink Configuration Tool**, which provides fully access to all function of ZEW2542.

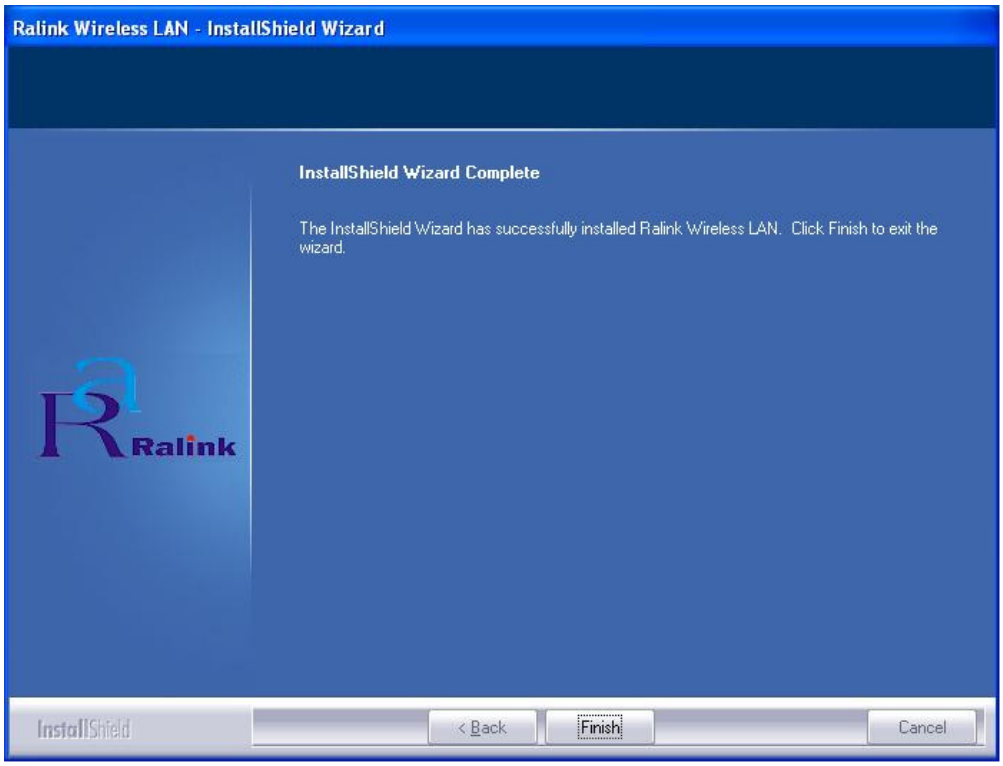
    b. If you prefer to use the wireless configuration tool provided by Windows XP or Vista, please select **Microsoft Zero Configuration Tool.**



4. Select **Optimize for WiFi mode** or **Optimize for performance mode** then click ***Next***.



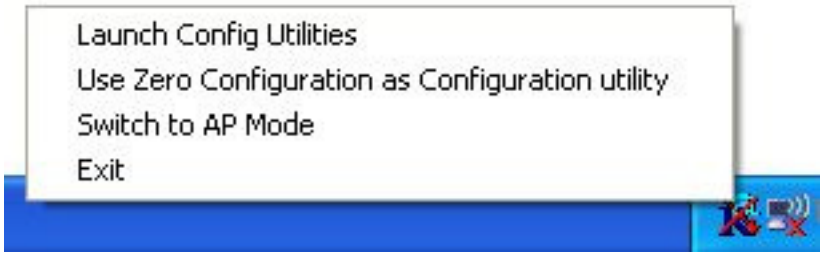
5. Click ***Finish*** to complete the software installation.



You will see a tray icon appear in your system tray at the bottom of the screen after the software and hardware installation completed successfully.

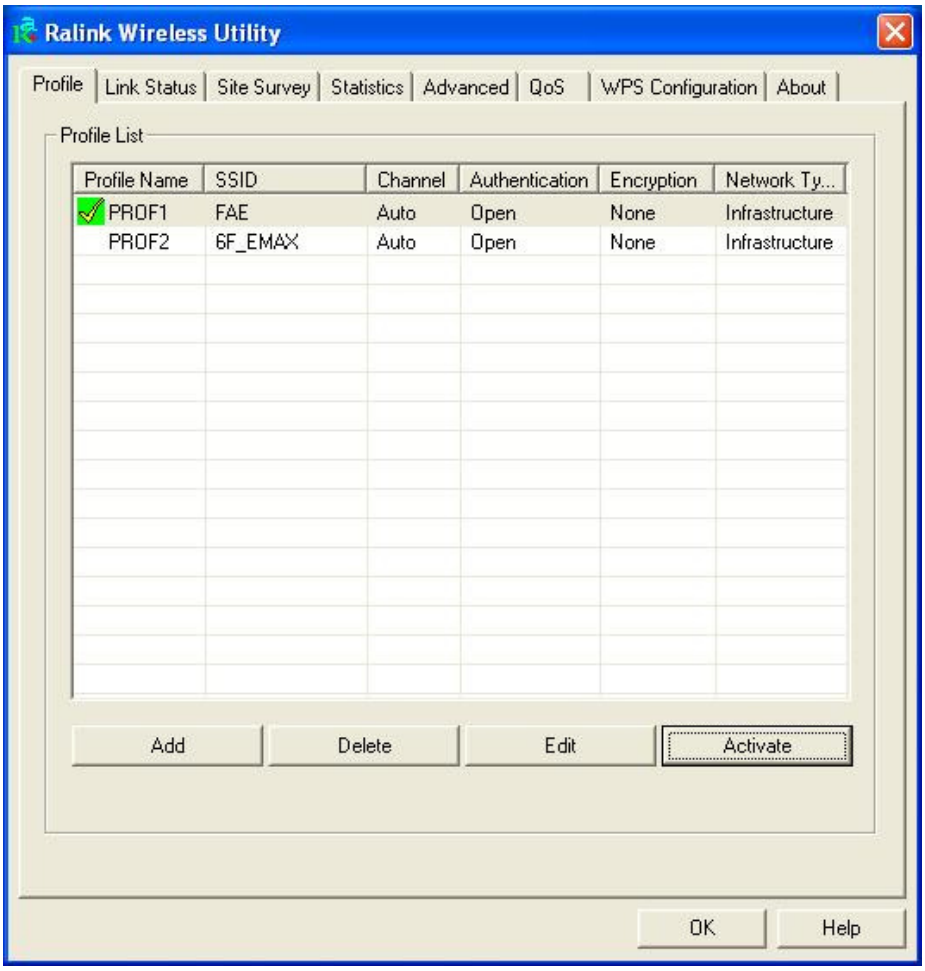
Chapter 4 Configuration

Right-click the tray icon and then click ***Launch Config Utilities*** to use Ralink configuration utility.



4.1 Profile

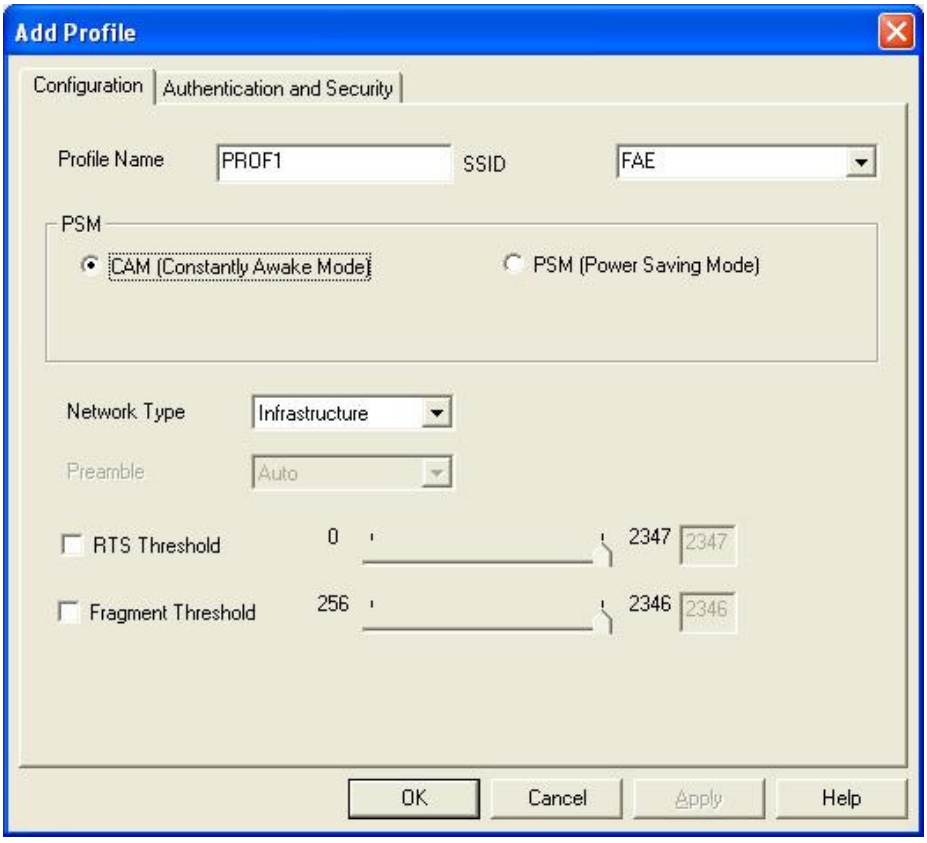
Profile can keep your favorite wireless setting among your home, office, and other public hotspot. You may save multiple profiles and activate the one at your preference.



1. **Definitions:**
   a. **Profile Name:** Name of the profile, preset to PROF* (* indicate 1, 2, 3,)
   b. **SSID:** The public name of a wireless network, Service Set IDentifier
   c. **Network Type:** Infrastructure and/or Ad-Hoc
   d. **Authentication:** Open, Shared, (Leap), WPA-PSK, WPA2-PSK, WPA and WPA2
   e. **Encryption:** WEP, TKIP, AES, and None
   f. **Channel:** Channel of the connected wireless network
2. **Add :** to create a new profile
3. **Edit :** to edit/modify/change parameter of an existing profile
4. **Delete :** to delete an existing profile
5. **Activate :** to make an existing profile become active and to connect

4.1.1 Add/Edit Profile

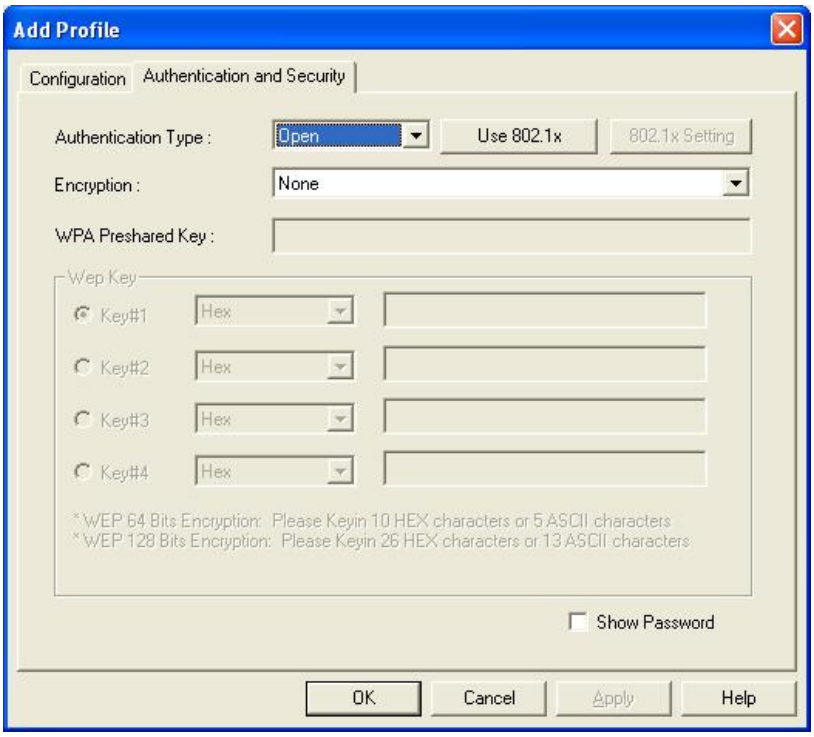
a. Configuration



1. **Profile Name:** Specify one name for the profile
2. **SSID:** Name of intended wireless network, User can key in the intended SSID name or use pull down menu to select from available Access Point.
3. **Network Type:** you can select one from Infrastructure and Ad-hoc modes
   Infrastructure: A wireless Router and/or Access Point is required.
   Ad-hoc: Peer-to-Peer network, no base station required.
4. Power Save Mode: Choose from CAM or PSM.
   CAM (Constantly Awake Mode): ZEW2542 will stay power-ON as long as the computer is connected to a power outlet.
   PSM (Power Saving Mode): ZEW2542 will hibernate when the computer is hibernating.

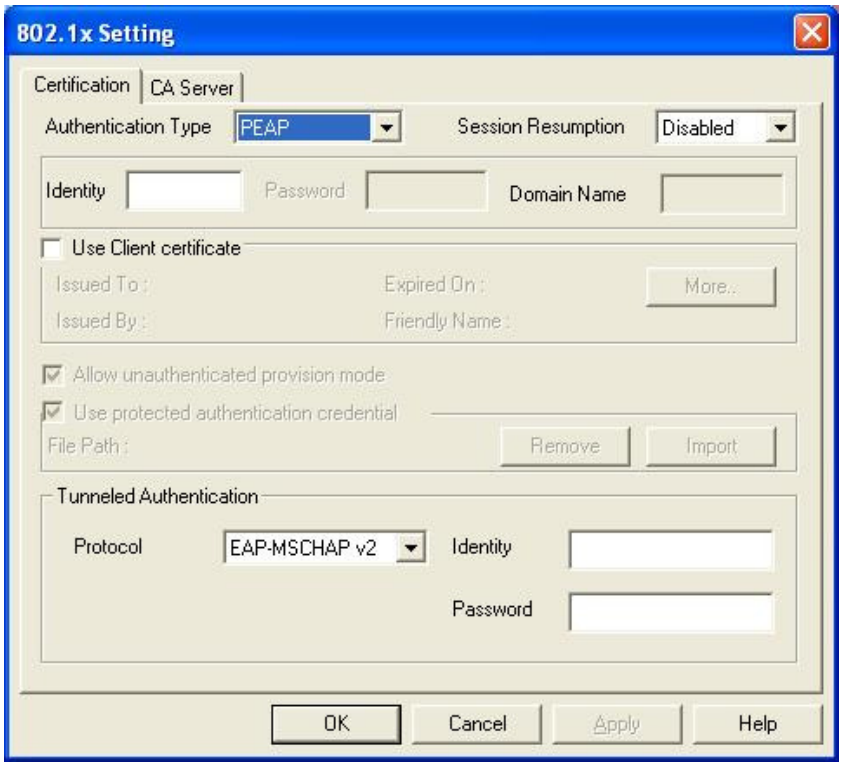
5. **RTS Threshold:** you can adjust the RTS threshold number by sliding the bar or key in the value directly. Default value = 2347
6. **Fragment Threshold:** you can adjust the Fragment threshold number by sliding the bar or key in the value directly. Default value = 2346

b. Authentication and Security



1. **Authentication:** Open, Shared, (Leap), WPA-PSK, WPA2-PSK, WPA and WPA2
2. **Encryption:** Algorithm used in BSS or IBSS, WEP, TKIP, AES, and None
3. **802.1x configuration:** It is an advanced encryption mode based on Radius server or authentication credentials.

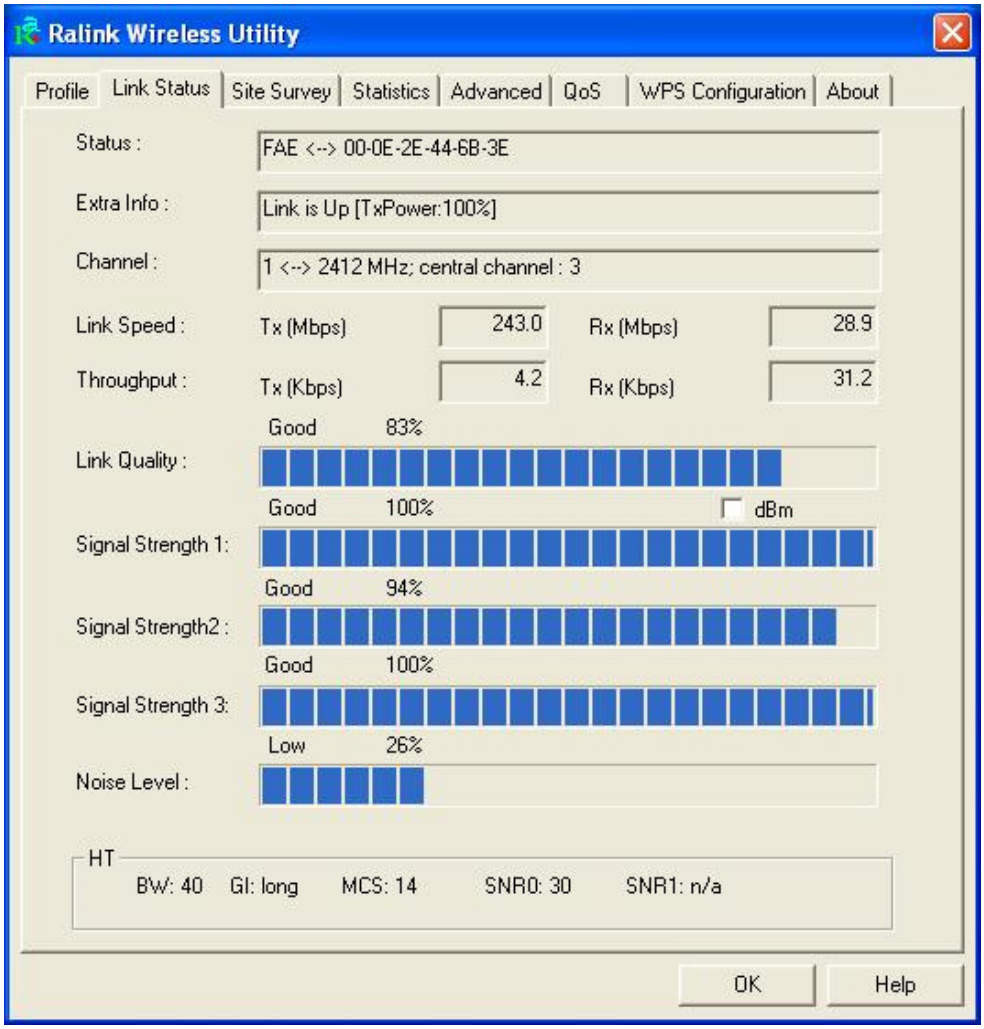
c. 802.1X



1. **Authentication Type:** The type selected here must be identical to the type of the 802.1x authentication type you're using.
2. **Session Resumption:** Enable or Disable.
3. **Domain Name:** Input the domain name of 802.1x authentication. This field will be grayed out when authentication type is not **EAP-FAST**.
4. **Use Client:** If the authentication type is using **PEAP** or **TTLS**, you can use the certificate stored on your computer. If the authentication type is using **TLS/Smart Card**, this box is always checked.
5. **Allow unauthenticated provision mode:** This box is always checked and can not be modified.
6. **Use protected authentication credential:** If the authentication type is using **EAP-FAST**, you can use protected authentication credential by check this box.
7. **Remove:** Remove the credential you imported previously.
8. **Import:** Import the authentication credential file (PAC or al file format), you'll be prompted to select a credential file from your computer.
9. **Protocol:** Select the protocol of tunneled authentication. This pull-down menu is only available when authentication type is using **PEAP** or **TTLS**. When using **EAP-FAST** as authentication type, the protocol setting is always **Generic Token Card** and can not be changed.
10. **Password Mode:** Select the password mode of **EAP-FAST** authentication mode. This setting is hidden when the authentication type is not **EAP-FAST**.

4.2 Link Status

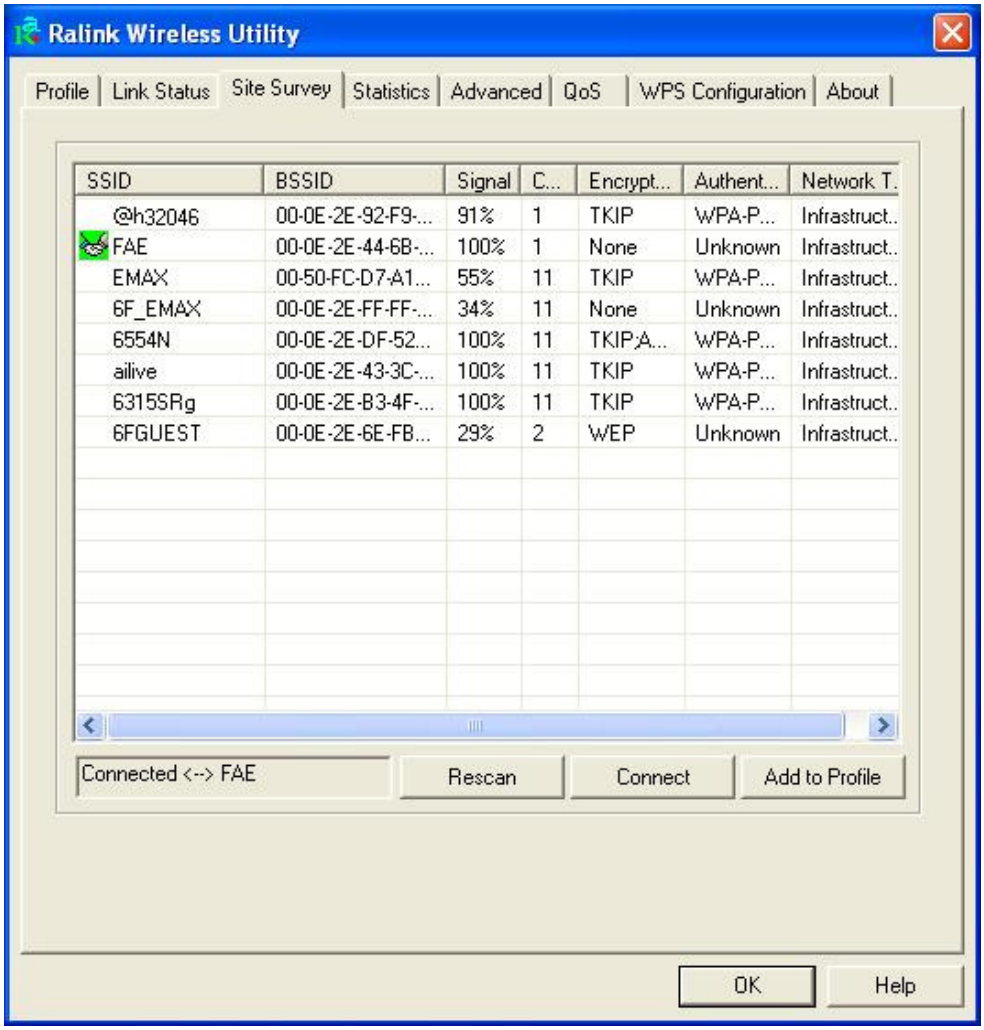
Link status page shows detail information about the current connection.



1. **Status:** Shows the current connected SSID / BSSID. If there's no active connection currently, "Disconnected" will be displayed.
2. **Extra Info:** Shows link status and its transmit power
3. **Channel:** Shows the current connected channel
4. **Link Quality:** Based on signal strength and TX/RX packet error rate (%)
5. **Signal Strength:** Shows in percentage (%) or dBm
6. **Noise Level:** Shows noise and signal strength ratio (%). If the value of this item is high, data transfer rate will drop.
7. **Transmit:**
   Link Speed: Shows current transmitting rate (Mbps)
   Throughput: Shows current transmitting throughput (Kbps)
8. **Receive:**
   Link Speed: Shows current receiving rate (Mbps)
   Throughput: Shows current receiving throughput (Kbps)

4.3 Site Survey

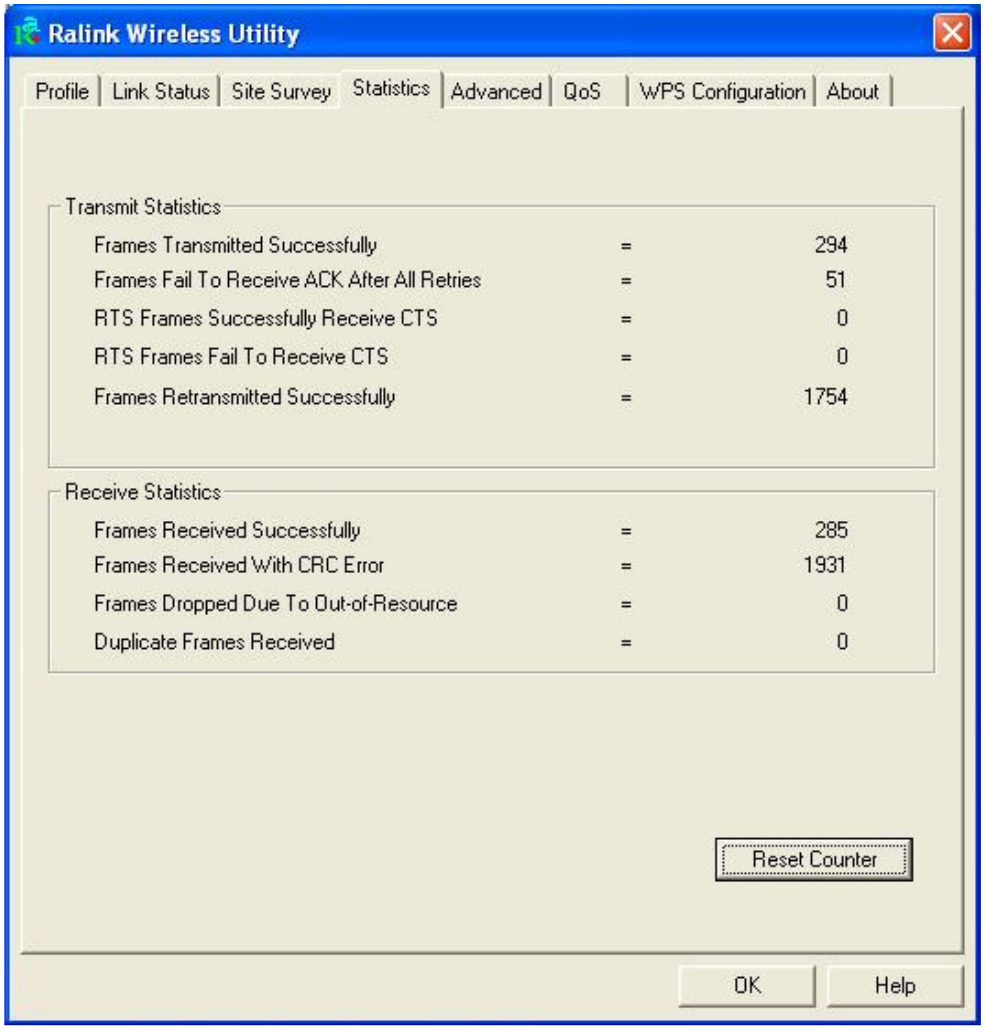
Under Site Survey tab, you will know information of all surrounding wireless networks from the last scan. Click ***Rescan*** to update and refresh. Or Select a SSID to add to your profile.



Indicates your current connected network.

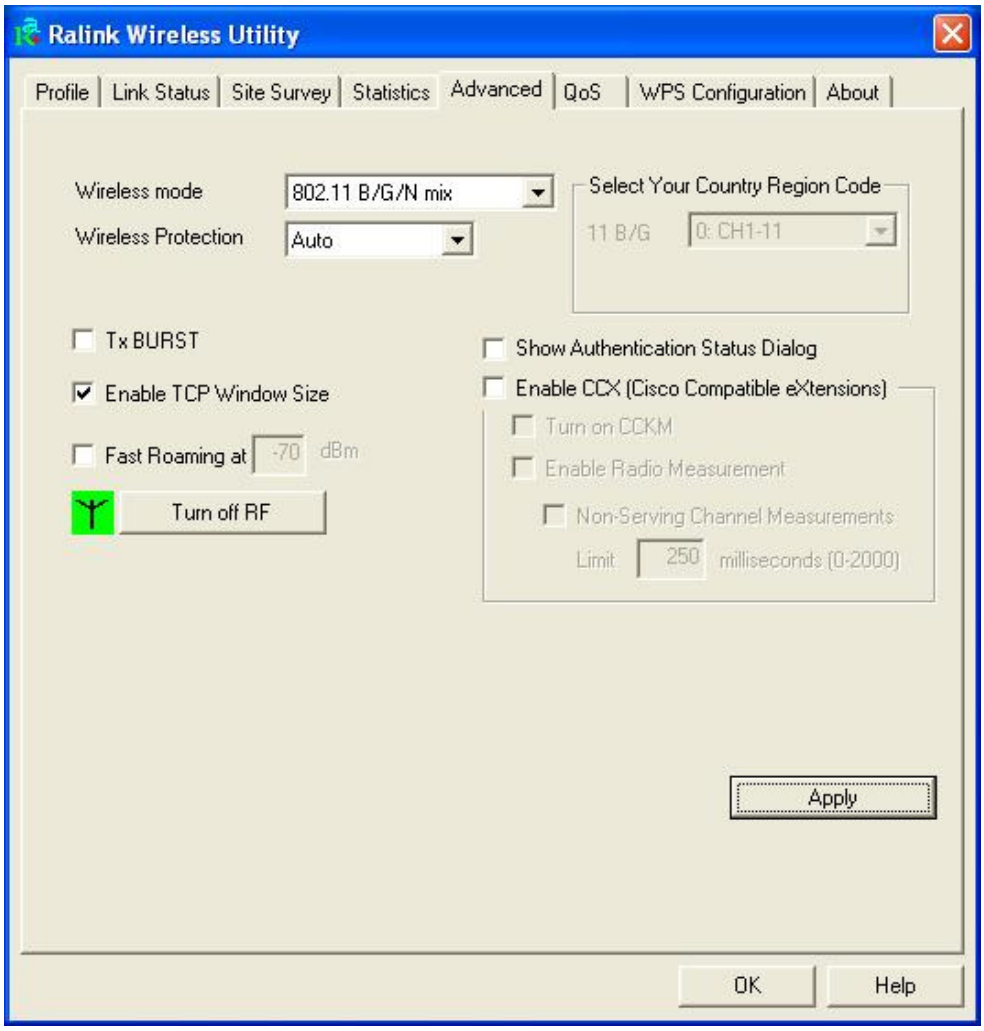
4.4 Statistics

Statistics page displays the detail counter information based on 802.11 MIB counters. This page translates that MIB counters into a format easier for user to understand



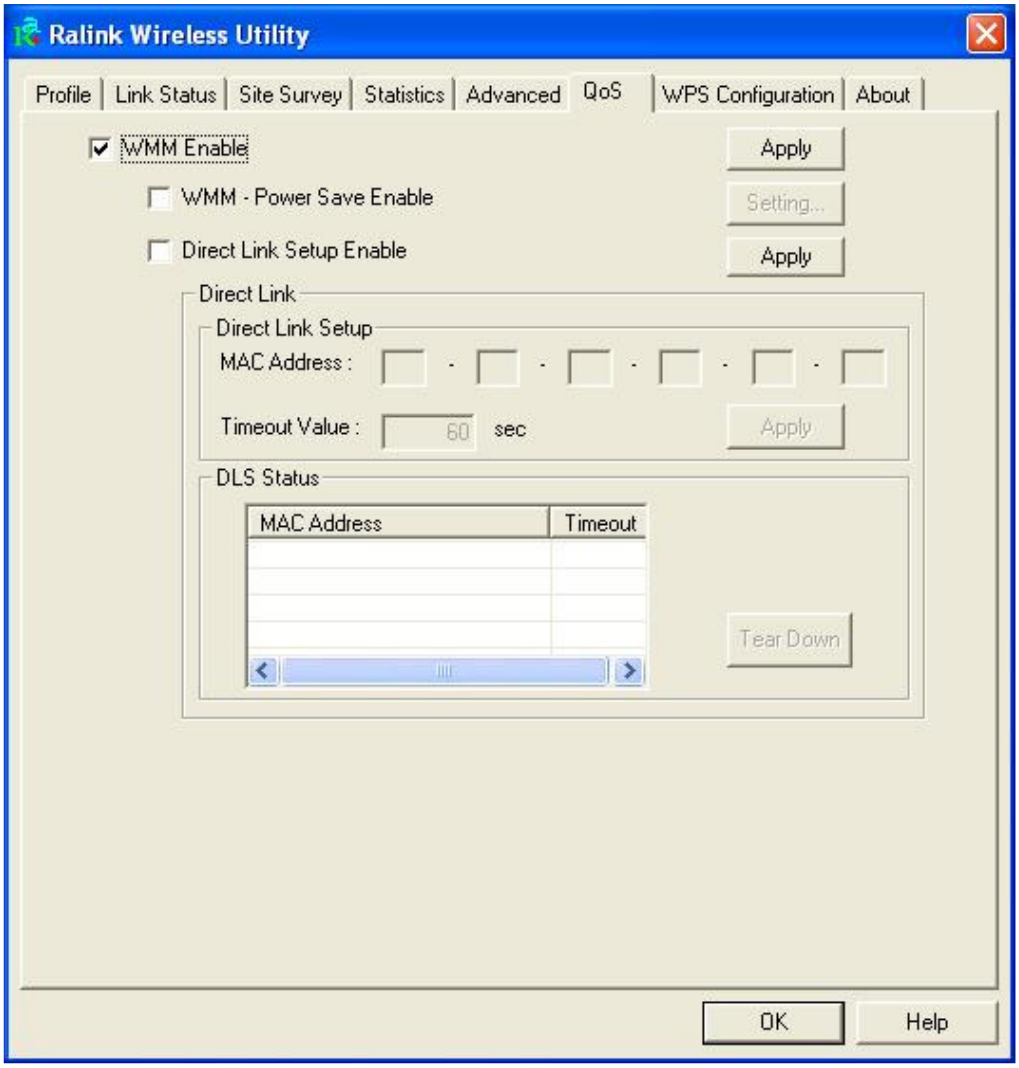
4.5 Advanced

The following figure shows Advance function of UI



1. **Wireless mode:** Select from 802.11B only, 802.11 B/G mixed, 802.11 B/G/N mixed, and 802.11G only
2. **Enable Tx BURST:** Ralink's proprietary frame burst mode. Suggest using with an Access Point that has the same technology.
3. **Enable TCP Window Size:** Check this box and the configuration utility will adjust TCP window size automatically to get better performance.
4. **Fast Roaming at:** Fast to roaming, setup by transmitting power
5. **Enable CCX(Cisco Compatible eXtensions):**
   a. **LEAP – Turn on CCKM**
   b. **Enable Radio Measurement:** channel measures every 0~2000 milliseconds

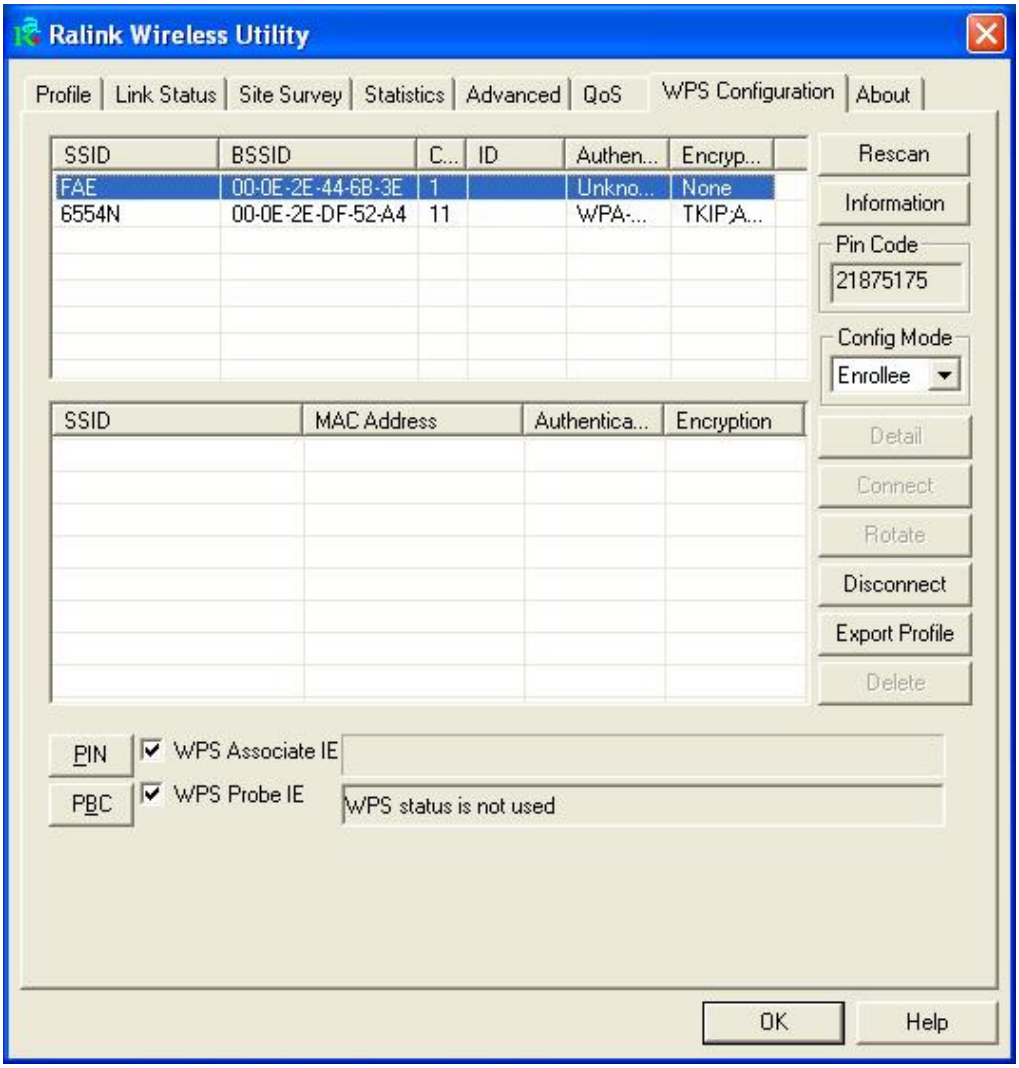
4.6 QoS



1. **WMM Enable:** Enable Wi-Fi Multi-Media
2. **WMM - Power Save Enable:** Enable WMM Power Save
3. **Direct Link Setup Enable:** Enable DLS (Direct Link Setup). This function will greatly improve the data transfer rate between WMM-enabled wireless devices.
   MAC Address: Input the MAC address of another WMM-enabled wireless device you wish to establish a direct link.
   Timeout Value: must be between 0~65535 in integer. If the value is zero represents it always connects. Default value of Timeout Value is 60 seconds.
   Tear Down: If you want to remove a specific wireless device from DLS table, select the device and click this button to remove it.

4.7 WPS Configuration

WPS page supports the configuration setup using PIN configuration method or PBC configuration method. WPS(Wi-Fi Protected Setup) is to simplify the security setup and management of Wi-Fi networks.



1. **WPS AP List:** Display the information of surrounding APs with WPS IE from last scan result, including SSID, BSSID, Channel, ID (Device Password ID), Security-Enabled.
2. **Rescan:** Update information on surrounding wireless network.
3. **Information:** Display the information about WPS IE on the selected network, list including Authentication Type, Encryption Type, Config Methods, Device Password ID, Selected Registrar, State, Version, AP Setup Locked, UUID-E and RF Bands
4. **PIN Code:** 8-digit numbers.
5. **Config Mode:** Enrollee or external Registrar
6. **Detail:** Information about Security and Key in the credential.
7. **Connect:** Connect to the selected network inside credentials.
8. **Rotate:** Connect to the next network inside credentials.

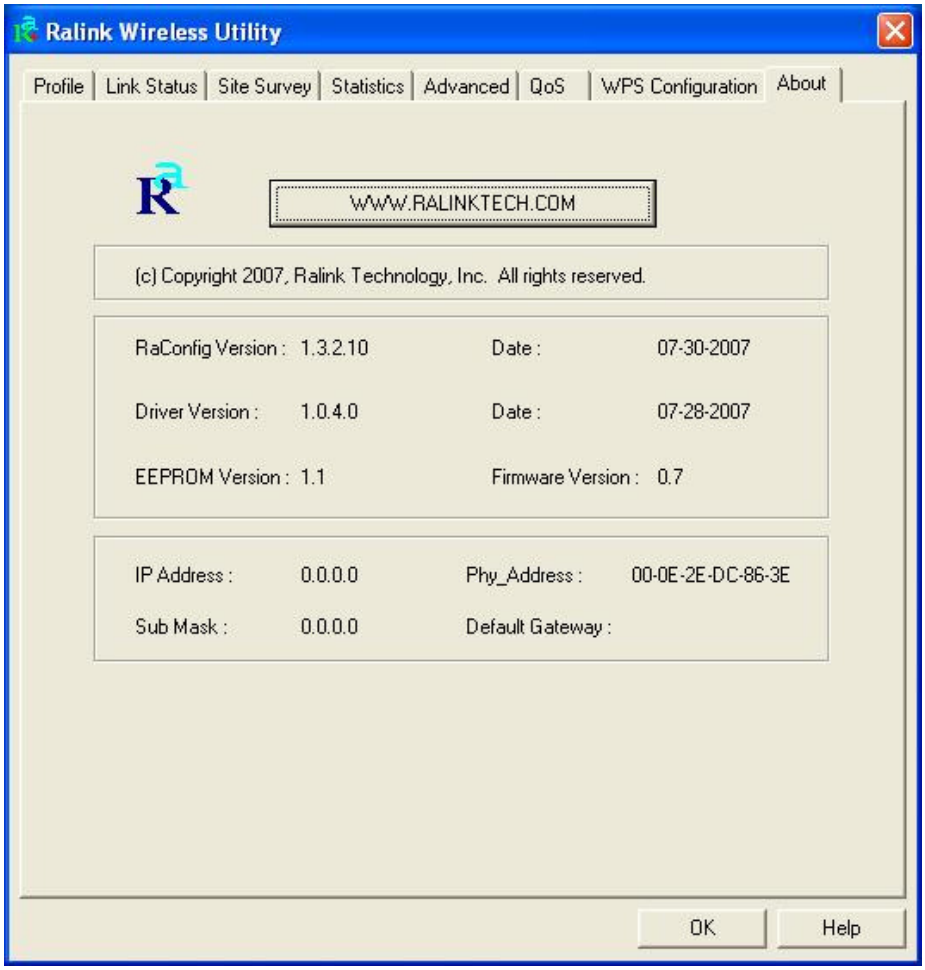
9. **Disconnect:** Stop WPS action and disconnect this active link.
10. **Export Profile:** Export all credentials to Profile.
11. **Delete:** Delete an existing credential.
12. **PIN:** Start to add to AP using PIN configuration method
13. **PBC:** Start to add to AP using PBC configuration method

Note: *When clicking PIN or PBC button, please don't click* ***Rescan*** *within two-minute. If you want to abort this setup within the interval, restart PIN/PBC or press Disconnect to stop WPS.*

14. **WPS associate IE:** Send the association request with WPS IE during WPS setup.
15. **WPS probe IE:** Send the probe request with WPS IE during WPS setup.

4.8 About

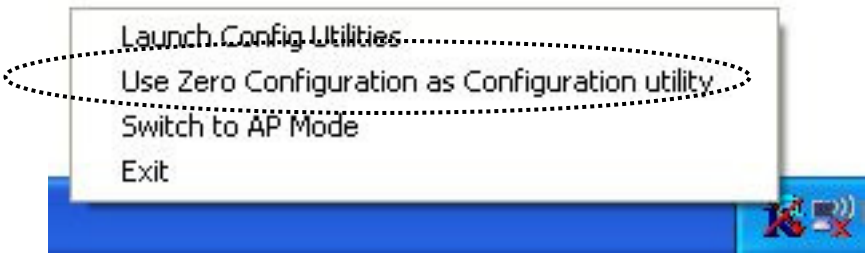
Display information about ZEW2542, such as Utility version/date, Driver version/date, EEPROM version and Firmware version.



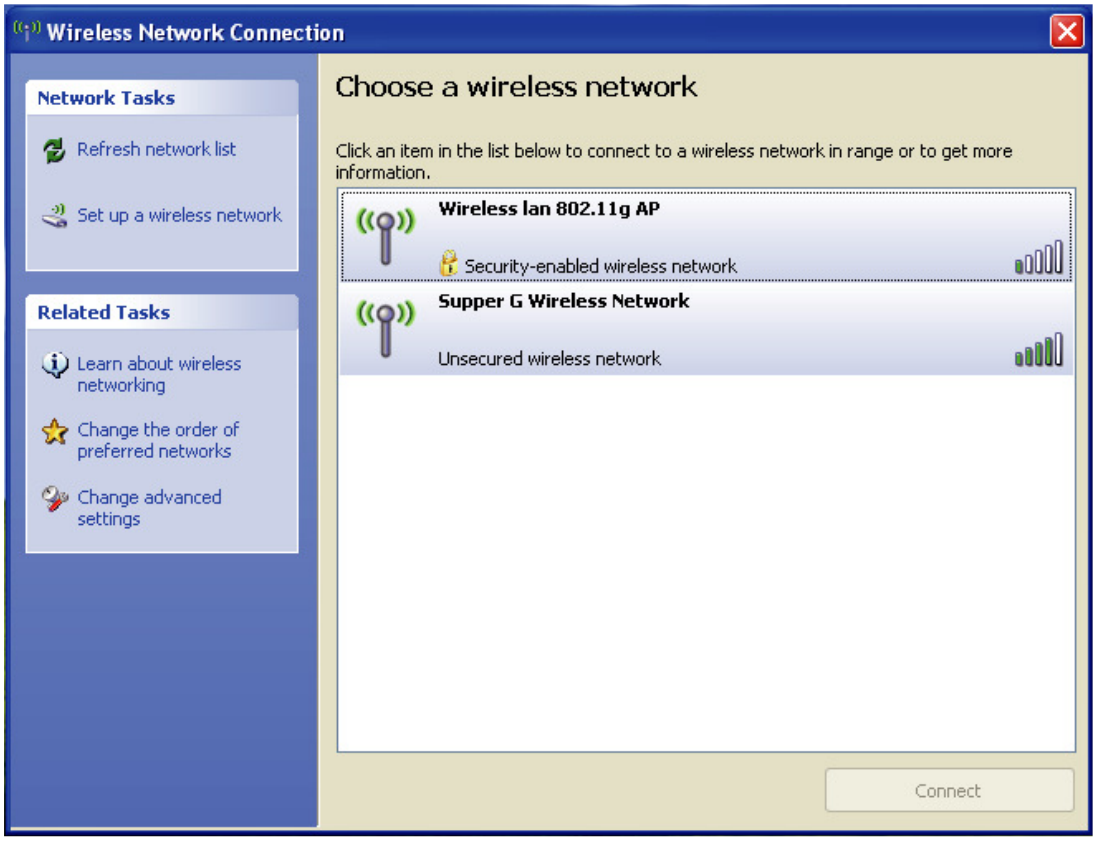
Chapter 5 Use Zero Configuration

Windows XP and Vista has a built-in wireless network configuration utility "Windows Zero Configuration" (WZC). It is a built in service to configure your wireless clients from Windows

1. Start using WZC, right click the tray utility and select **Use Zero Configuration as Configuration utility**.

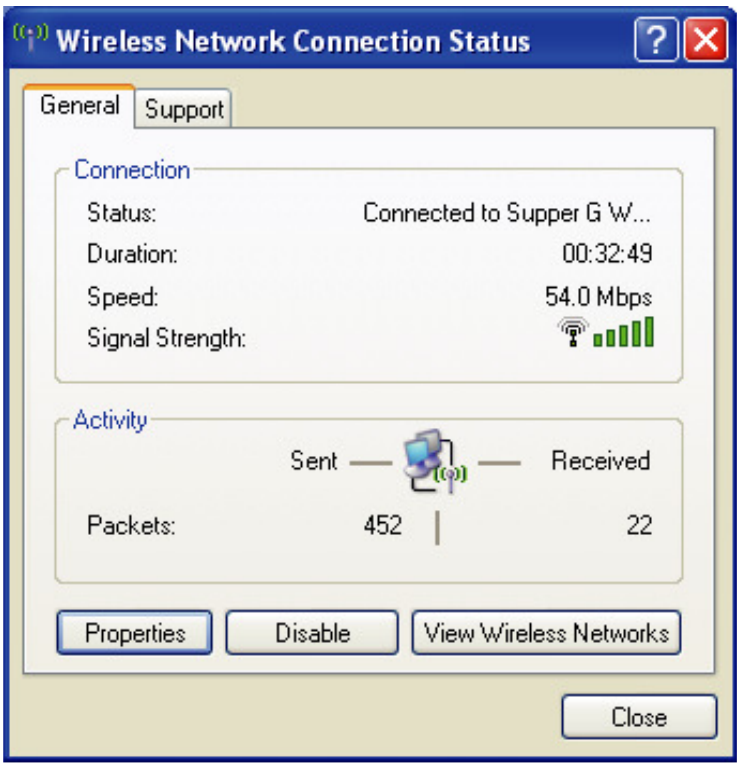


2. The windows wireless network connection will appear, double click the wireless network icon on the system tray to check the wireless network, choose the network and click **Connect** to setup the association.

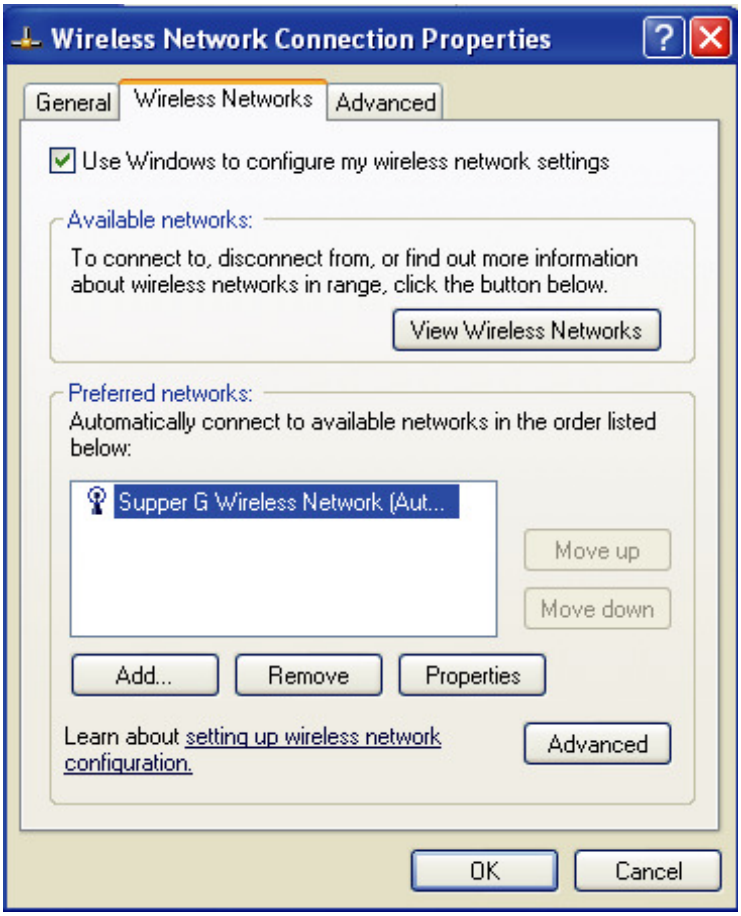

Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
Wireless lan 802.11g AP
Security-enabled wireless network
Supper G Wireless Network
Unsecured wireless network
Connect

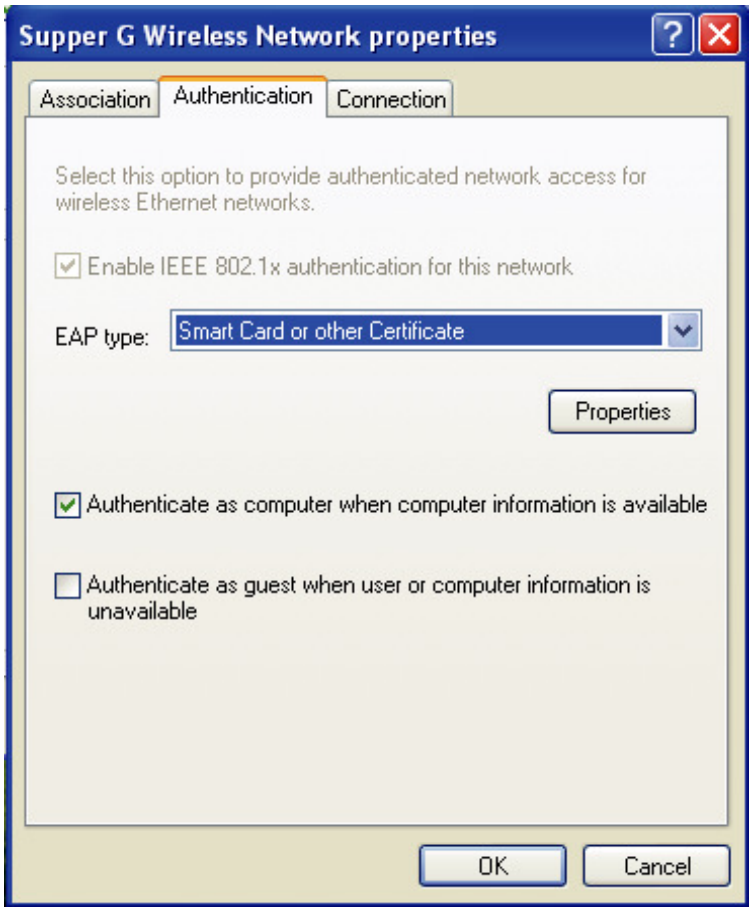
3. If your wireless router has been encrypted, there will be a window appeared for input the key. Please input the key and click **Connect**, then the connection connect.

4. To configure the wireless connect properties, please right click the wireless icon in the system tray and choose **Status** to open the page **Wireless Network Connection Status**.

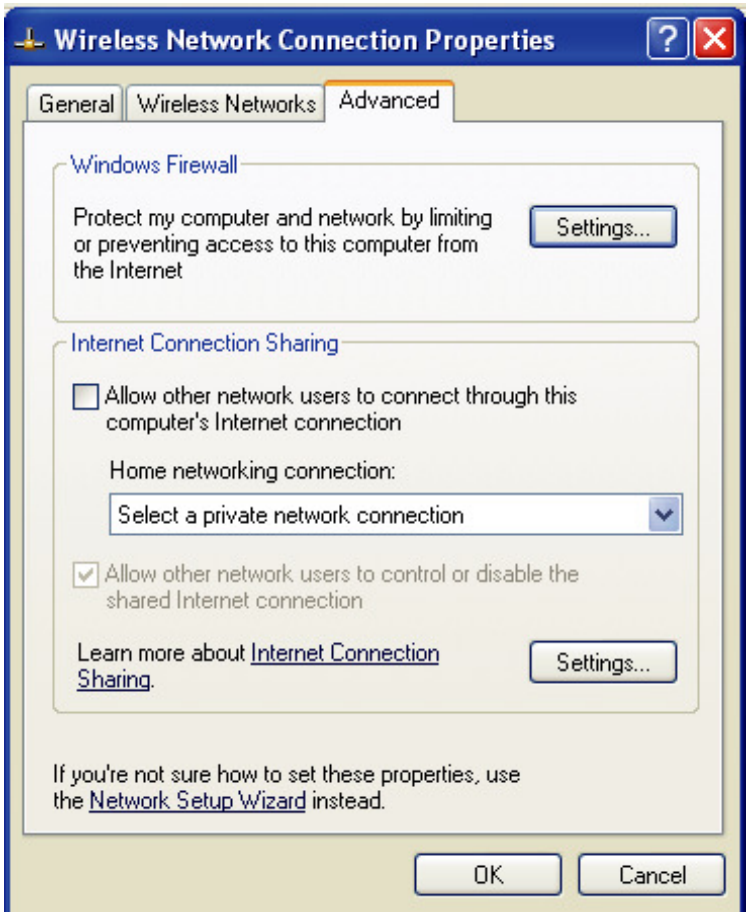


5. Click **Properties** button in **General** page and choose the tab **Wireless Networks** to add the **SSID** of available network by clicking **Add**, if there are several available networks, linking priority could be configured by the button **Move up** and **Move down**. The icon shows the current linked AP. Click **Properties** to configure authentication of wireless connection.


Wireless Network Connection Properties
General
Wireless Networks
Advanced
Use Windows to configure my wireless network settings
Available networks:
To connect to, disconnect from, or find out more information about wireless networks in range, click the button below.
View Wireless Networks
Preferred networks:
Automatically connect to available networks in the order listed below:
Supper G Wireless Network (Aut...
Move up
Move down
Add...
Remove
Properties
Learn about setting up wireless network configuration.
Advanced
OK
Cancel


Supper G Wireless Network properties
Association
Authentication
Connection
Select this option to provide authenticated network access for wireless Ethernet networks.
Enable IEEE 802.1x authentication for this network
EAP type:
Smart Card or other Certificate
Properties
Authenticate as computer when computer information is available
Authenticate as guest when user or computer information is unavailable
OK
Cancel

6. **Advanced** page configures firewall and connection sharing.


Wireless Network Connection Properties
General
Wireless Networks
Advanced
Windows Firewall
Protect my computer and network by limiting or preventing access to this computer from the Internet
Settings...
Internet Connection Sharing
Allow other network users to connect through this computer's Internet connection
Home networking connection:
Select a private network connection
Allow other network users to control or disable the shared Internet connection
Learn more about Internet Connection Sharing.
Settings...
If you're not sure how to set these properties, use the Network Setup Wizard instead.
OK
Cancel

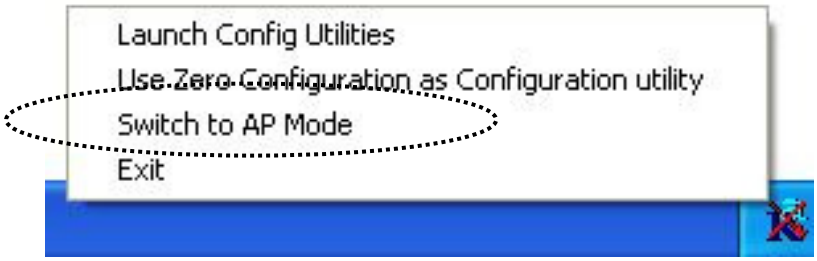
Chapter 6 Soft AP

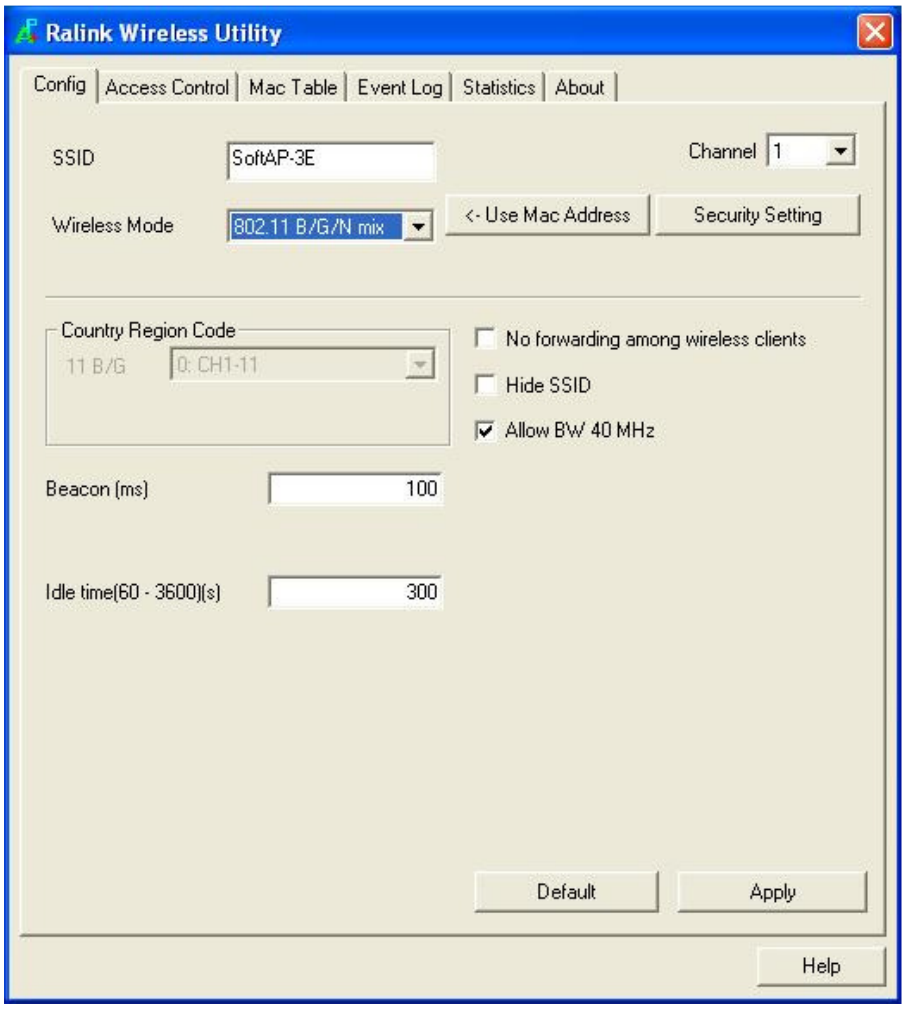
ZEW2542 has two modes: working station and Soft AP. After start Soft AP, ZEW2542 will be an AP to accept any wireless device access.

6.1 Start Soft AP

After starting ZEW2542 driver, you will see icon in the system tray.

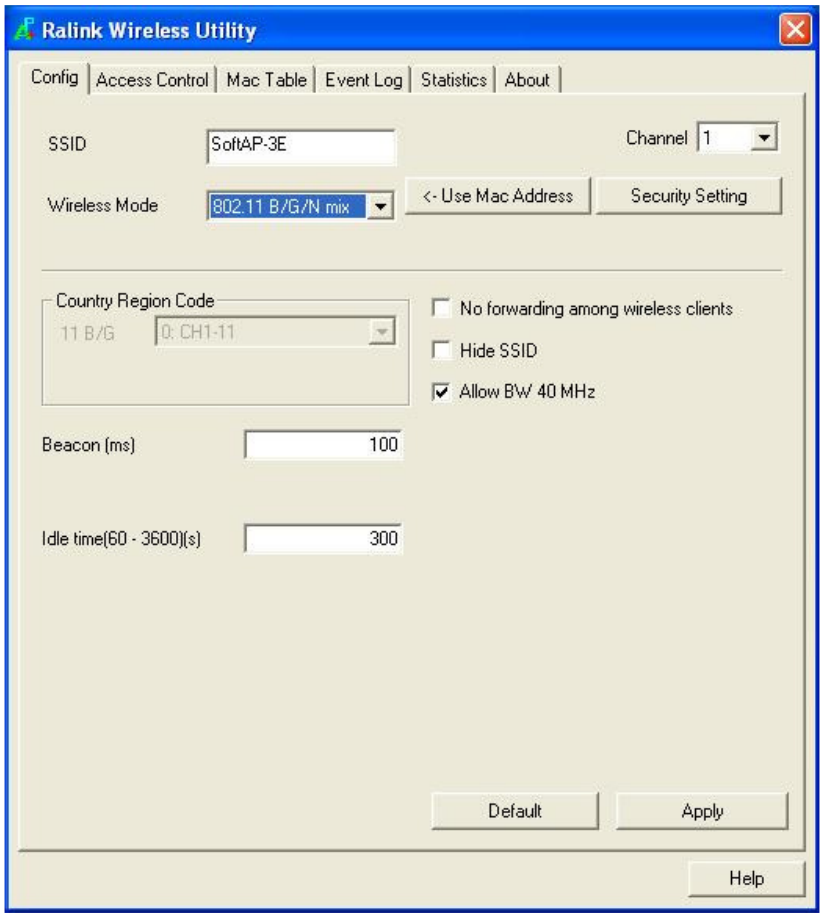
Right click the icon and choose **Switch to AP Mode**, the tray icon will change to , and the soft AP configuration Utility window will appear as below.



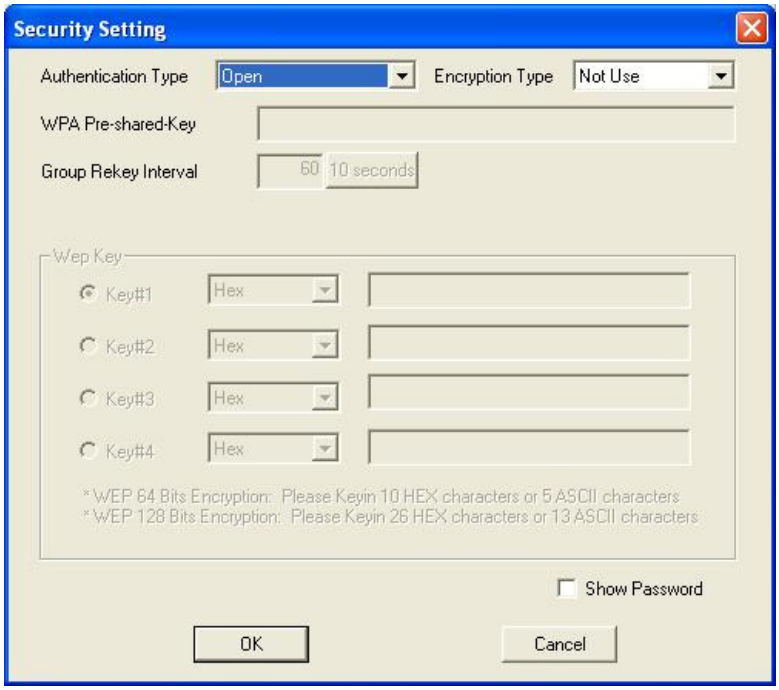


6.2 Configuration

In soft AP configuration Utility page, you can make some basic configurations, such as wireless network name, mode, channel and authentication.

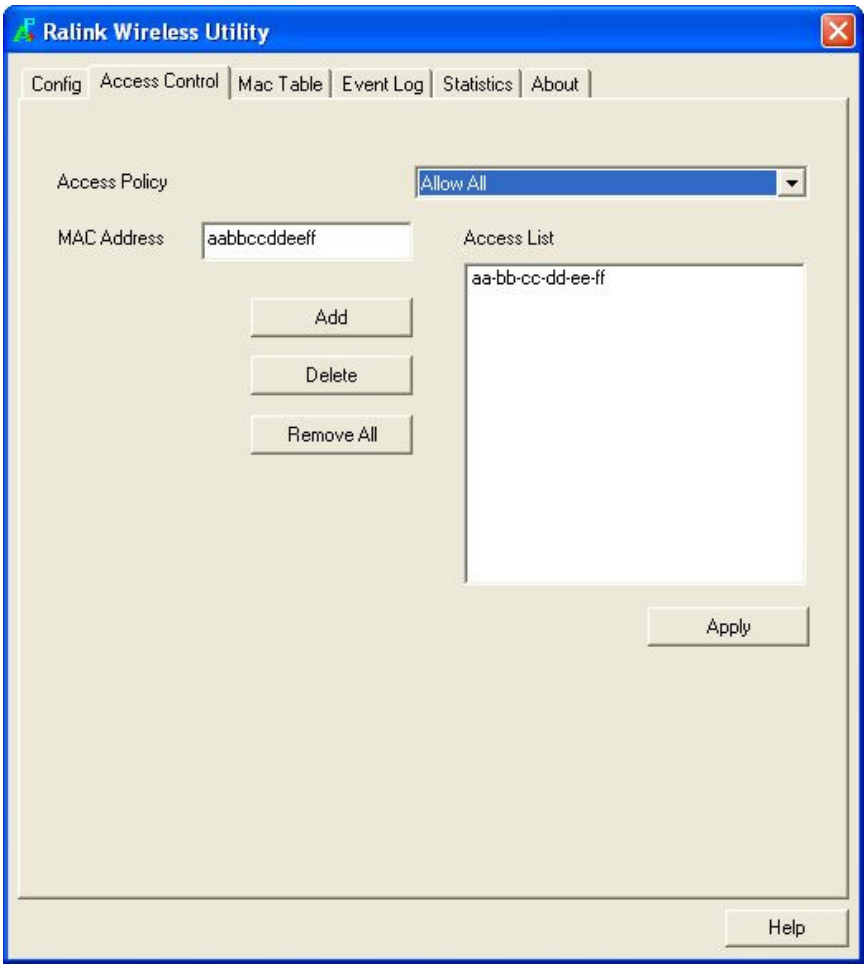


Click **Security Setting** button to make different security configurations of wireless communication, and you can choose the authentication type or encryption type.



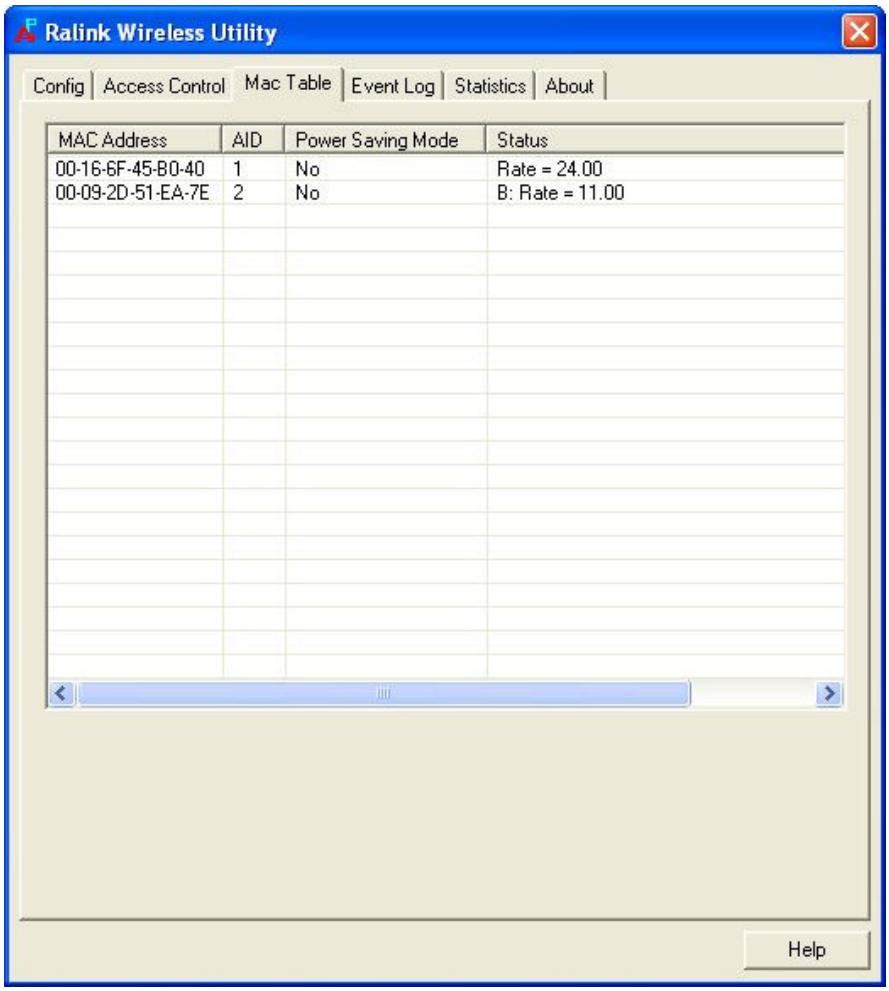
6.3 Access Control

Choose **Access Control** tab to start MAC control. Access control includes **Allow All** and **Reject All**. After editing the MAC address access list, only the MAC in the Allow All list could access the Soft AP.



6.4 MAC Table

MAC Table page shows the information of the wireless devices accessed to this soft AP.



6.5 Switch to Working Station mode

In the Soft AP mode, right-click the icon in the system tray and choose **Switch to Station Mode**, then ZEW2542 is switching to working station mode with an interface of working station.

Chapter 7. Specifications

General Features	
Standards	IEEE 802.11n, IEEE 802.11g, IEEE 802.11b standards
Interface	USB2.0
OS	Windows 2000/ XP/ Vista
User interface	Easy to use user configuration software
roaming	Support multipoint auto roaming and configuration; Support wireless network environments auto detect.
LED	Link / activity
Antenna type	Two printed antennas
Power	5V bus powered
RF and baseband Technical Features	
Frequency range	2.4000 ~ 2.4835GHz
Radio data rate	11n (20MHz): up to 144Mbps 11n (40MHz): up to 300Mbps 11g: 54/48/36/24/12/9/6Mbps 11b: 11/5.5/2/1Mbps
Modulation	OFDM, CCK, BPSK, QPSK
Spectrum Spread Technology	DSSS
Transmit output power	11n: 14~15 dBm OFDM: 15dBm ± 2dBm 11Mbps CCK: 16~18dBm
Antenna Gain	2dBi*2
Channels	11 Channels (USA, Canada) 13 Channels (Europe) 14 Channels (Japan)
Transmission Distance	Indoor up to 150m (limited to environment) Outdoor up to 450m (limited to environment)
Media Access Protocol	WMM
Data security	WPA/WPA2; 64/128-bit WEP; Cisco CCX Support
Environmental and Physical	
Operation Temp.	0°C ~ 50°C
Storage Temp.	-20º C ~ 70º C
Operation Humidity	5% ~ 90% RH non-condensing
Storage Humidity	5% ~ 90% RH non-condensing

Chapter 8. TroubleShooting

This chapter provides solutions to problems that may occur during the installation and operation of ZEW2542. Read the descriptions below to solve your problems.

1. The ZEW2542 does not work properly.

Reinsert ZEW2542 into your PC's USB slot.
Right click on My Computer and select Properties. Select the device manager and click on the Network Adapter. You will find ZEW2542 if it is installed successfully. If you see the yellow exclamation mark, the resources are conflicting. You will see the status of ZEW2542. If there is a yellow question mark, please check the following:
Make sure that your PC has a free IRQ (Interrupt ReQuest, a hardware interrupt on a PC.)
Make sure that you have inserted the right adapter and installed the proper driver. If ZEW2542 does not function after attempting the above steps, remove it and do the following:
Uninstall the driver software from your PC.
Restart your PC and repeat the hardware and software installation as specified in this User Guide.

2. I cannot communicate with the other computers linked via Ethernet in the Infrastructure configuration.

Make sure that the PC to which ZEW2542 is associated is powered on.
Make sure that ZEW2542 is configured on the same channel and with the same security options as with the other computers in the Infrastructure configuration.

3. What should I do when the computer with ZEW2542 installed is unable to connect to the wireless network and/or the Internet?

Check that the LED indicators for the broadband modem are indicating normal activity. If not, there may be a problem with the broadband connection.
Check that the LED indicators on the wireless router are functioning properly. If not, check that the AC power and Ethernet cables are firmly connected.
Check that the IP address, subnet mask, gateway, and DNS settings are correctly entered for the network.
In Infrastructure mode, make sure the same Service Set Identifier (SSID) is specified on the settings for the wireless clients and access points.
In Ad-Hoc mode, both wireless clients will need to have the same SSID. Please note that it might be necessary to set up one client to establish a BSS (Basic Service Set) and wait briefly before setting up other clients. This prevents several clients from trying to establish a BSS at the same time, which can result in multiple singular BSSs being established, rather than a single BSS with multiple clients associated to it.
Check that the Network Connection for the wireless client is configured properly.
If Security is enabled, make sure that the correct encryption keys are entered on both ZEW2542 and the access point.

4. I can't find any wireless access point / wireless device in *Site Survey* function.

- Click *Rescan* for few more times and see if you can find any wireless access point or wireless device.
- Please move closer to any known wireless access point.
- *Ad-hoc* function must be enabled for the wireless device you wish to establish a direct wireless link.
- Please adjust the position of ZEW2542 (you may have to move your computer if you're using a notebook computer) and click *Rescan* button for few more times. If you can find the wireless access point or wireless device you want to connect by doing this, try to move closer to the place where the wireless access point or wireless device is located.

5. Nothing happens when I click *Launch config utilities*

- Please make sure ZEW2542 is inserted into your computer's USB port. If the Ralink configuration utility's icon is black, ZEW2542 is not detected by your computer.
- Reboot the computer and try again.
- Remove ZEW2542 and insert it into another USB port.
- Remove the driver and re-install.

6. I can not establish connection with a certain wireless access point

- Click *Connect* for few more times.
- If the SSID of access point you wish to connect is hidden (nothing displayed in *SSID* field in *Site Survey* function), you have to input correct SSID of the access point you wish to connect.
- You have to input correct passphrase / security key to connect an access point with encryption.
- The access point you wish to connect only allows network cards with specific MAC address to establish connection. Please go to *About* tab and write the value of *Phy_Addess* down, then present this value to the owner of access point to add the MAC address of your ZEW2542 to owner's access point's list.

7. The network is slow / having problem when transferring large files

- Move closer to the place where access point is located.
- Enable *Wireless Protection* in *Advanced* tab.
- Try a lower TX Rate in *Advanced* tab.
- Disable *Tx Burst* in *Advanced* tab.
- Enable *WMM* in *QoS* tab if you need to use multimedia / telephony related applications.
- Disable *WMM – Power Save Enable* in *QoS* tab.
- There could be too much people using the same radio channel. Ask the owner of the access point to change the channel number.